## CLAIMS

1. A method of segmenting image data having a plurality of feature values at each pixel, in which the data is represented as points in a segmentation vector space which is the product of the vector space of feature values and the vector space of pixel addresses, wherein segments are represented as locations in the segmentation vector space, and the membership of a segment for each pixel is determined by the distance in segmentation vector space from the data point representing the pixel to the location of the segment.

2. A method according to Claim 1, in which the segments are represented as points.

3. A method according to Claim 1, in which the segments are represented as linear functions mapping the vector space of pixel locations to the vector space of pixel values.

4. A method according to Claim 1, in which the distance measure is a Euclidean distance.

5. A method according to Claim 1, in which the distance measure is a Manhattan distance.

6. A method according to Claim 1, in which the coordinate axes are scaled to equalize the variances of the data along each axis.

7. A method according to Claim 1, in which the coordinate axes are scaled in order to minimize the product of errors evaluated along each axis, with the constraint that the scaling factors sum to a constant value.

8. A method according to Claim 1, in which the distance measure is a Mahalanobis distance.

9. A method of segmenting image data having a plurality of feature values at each pixel, comprising the steps of representing the data as points in a segmentation vector space which is the product of the vector space of feature values and the vector space of pixel addresses; representing segments as locations in the segmentation vector space; determining a covariance matrix of the image data in each segment; measuring a distance in segmentation vector space of each pixel to each segment location taking into consideration said covariance matrix and determining the membership of a segment for each pixel through said distance measure.

10. A method according to Claim 9, where the covariance matrix $\Lambda$of the data in the segment is given by

$$\Lambda_{ij} = \frac{1}{K_S - 1} \sum_{k \in S} (x_{ik} - \mu_i)(x_{jk} - \mu_j)$$

where $(x_1, x_2, \cdots, x_N)_k, k \in S$ are vectors in the multidimensional space belonging to segment $S$, and the location of the segment is given by

$$(\mu_1, \mu_2, \cdots, \mu_N) = \frac{1}{K_S} \sum_{k \in S} (x_1, x_2, \cdots, x_N)_k$$

where $K_S$ is the the number of points in segment $S$.

11. A method according to Claim 10, wherein the distance measure is equal to $(\mathbf{x} - \mu)\Lambda^{-1}.(\mathbf{x} - \mu)^T$.

12. A method of segmenting video data having a plurality of feature values at each pixel in a sequence of pictures, in which the data is represented as points in a segmentation vector space which is the product of the vector space of feature values and the vector space of pixel addresses, and wherein segments are represented as locations in the segmentation vector space, the method comprising the steps for each picture of initially assigning pixels to segments according to the segment membership of the respective pixel in the preceding picture in the sequence; calculating the location in segmentation vector space for each initial segment utilising feature values from the current picture and determining the membership of a segment for each pixel according to the distance in segmentation vector space from the data point representing the pixel to the location of the segment.

13. A method according to Claim 12, in which the segments are represented as points.

14. A method according to Claim 12, in which the segments are represented as linear functions mapping the vector space of pixel locations to the vector space of pixel values.

15. A method according to Claim 12, in which the distance measure is a Euclidean distance.

16. A method according to Claim 12, in which the distance measure is a Manhattan distance.

17. A method according to Claim 12, in which the coordinate axes are scaled to equalize the variances of the data along each axis.

18. A method according to Claim 12, in which the coordinate axes are scaled in order to minimize the product of errors evaluated along each axis, with the constraint that the scaling factors sum to a constant value.

19. A method according to Claim 12, in which the distance measure is a Mahalanobis distance.

20. A method of segmenting image data having a plurality of feature values at each pixel, in which the data is represented as points in a segmentation vector space which is the product of the vector space of feature values and the vector space of pixel addresses, comprising the steps of scaling the image data so as substantially to equalize the variance of the data in at least one dimension of the pixel address and each dimension of the feature value; initially assigning pixels to segments; representing each segment as a location in the segmentation vector space; and determining the membership of a segment for each pixel according to the distance the segmentation vector space from the data point representing the pixel to the location of the segment.

21. A method of segmenting image data having a plurality of feature values at each pixel, comprising the steps of representing the image data as points in a segmentation vector space which is the product of the vector space of feature values and the vector space of pixel addresses in a toroidal canvas; initially assigning pixels to segments represented as locations in the segmentation vector space, and determining the membership of a segment for each pixel according to a distance measure from the data point representing the pixel to the representation of the segment.

22. A method according to any one of the preceding claims, in which the feature values include pixel values and motion vector values.

23. A method according to Claim 22, in which the feature values include displaced frame differences.

24. A method according to any one of the preceding claims, in which each pixel is chosen to be a member of a single segment determined by minimizing the distance measure.

25. A method according to any one of the preceding claims, in which the number of segments is chosen by the user.

26. A method according to any one of the preceding claims, in which the number of segments is chosen as a function of the input data.

27. A method according to any one of the preceding claims, in which the number of segments is chosen so that the variance of an overall error measure approaches a predetermined value.

28. A method according to any one of the preceding claims, in which two or more parallel versions of the algorithm are run with different numbers of segments and the number of segments chosen is based on the relative performance of the two versions.

29. A method according to any one of the preceding claims, in which the representations of segments in the vector space are updated according to the segment membership of pixels.

30. A method according to any one of the preceding claims, in which the processes of assigning pixels to segments and of updating the representations of segments are repeated alternately.

31. A method according to any one of the preceding claims, in which the initial segmentation is taken from the previous picture in a sequence of pictures.